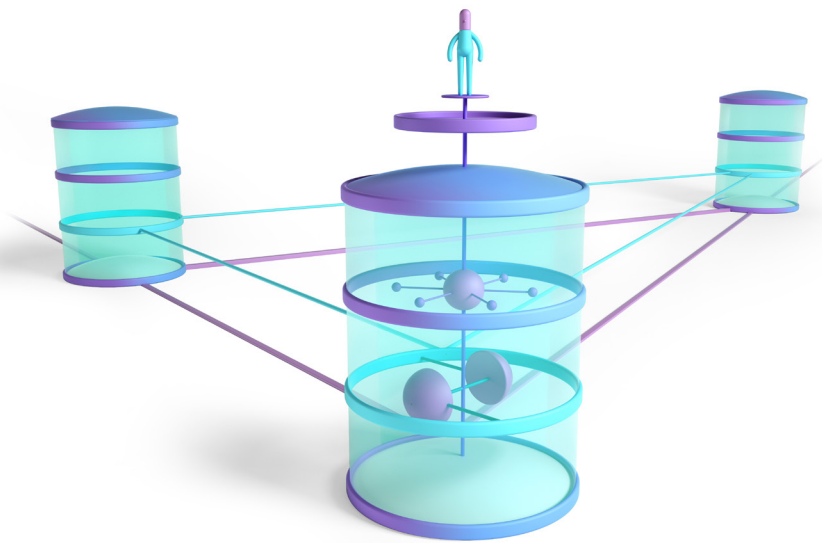


LTO Network

Visionary paper

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Preface

LTO Network has been servicing enterprise clients for the last four years. A year ago we started focusing on decentralized workflows. This changed the way new clients approach us, in the most peculiar way.

“We want to do something with the blockchain. Can you please come up with a way, how we can apply it to our organization?”

There is no lack of great blockchain projects. But all of them seem to suffer from the same problem; little to no adoption. Can it be that the blockchain is a solution without a problem?

“The biggest waste of all is building a product that customers refused to use.”
- Eric Ries, *The Lean Startup*

Before building yet another great, but unused, blockchain project, we felt we had to dive into this phenomenon. We’ve interviewed dozens of business leaders, corporate working groups and blockchain projects and found a remarkable misalignment in their perception of the blockchain technology.

Through this paper, we would like to share our findings from these interviews and propose our solution to get the blockchain from the current state towards being a fundamental part of our digital infrastructure.

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Introduction

After being the mysterious domain of insiders for almost a decade, multinationals and governments are gradually entering the blockchain arena. The spike of interest has created an atmosphere where the willingness to use blockchain technology is very high.

Despite an abundance of task forces and working groups, organizations are struggling to figure out where the actual strategic business value for them lies.

Although cryptocurrencies are growing in hundreds of billions USD in market cap, blockchain barely shows any significant, actively used real-world applications. In contrary to other emerging technologies, like artificial intelligence or the Internet of Things, it is unlikely that you as a consumer use a product powered by blockchain.

Naysayers argue that blockchain lacks the strategic value needed to deliver real-world use cases. Supposedly it is mainly a tool for swindlers and hustlers, relying on the greater fool theory. If organizations continue to fail in finding strategic applications for the blockchain, this skepticism can evaporate the current optimistic atmosphere, as blockchain technology itself may become the scapegoat for failed pilots and projects.

“The strength of trust is as weak as its weakest link”

LTO Network’s story commences in 2014. What started out as a document engine MVP gradually evolved into a workflow engine. As time went on, our clients got bigger and processes more encompassing. Being facilitators in the processes, we became the trusted third party for the users of our system.

Organizations could be severely impacted if the data we stored were to be manipulated. We realized that we couldn’t rely on trust alone. Adding layers of bureaucracy would help, but it would kill efficiency.

Then along came blockchain technology, which offered the potential of solving all these problems at once without compromising productivity.



2. Shaking up the echo-chamber

It is simple to dismiss the critics as uninformed technophobes that lack vision. Back in 1995, similar arguments were made about the Internet, like the infamous Newsweek essay “Why the Internet Will Fail”. While there are many similarities to the Internet, there’s also a striking difference. In 1995 the internet enthusiasts greatly outnumbered the critics. Can we say the same today about blockchain?

If we’re honest, we must admit that most people that are interested in blockchain, merely care about speculation. The general public is reluctant to use blockchains like bitcoin for its intended purpose and apathetic about the technology in general.

This is a far cry from the sound that resonates within the blockchain community. For us insiders, it may seem that we are fairly close to building a completely decentralized internet of value and soon can break free from trusted third parties.

From an outside view, our community closely resembles a classic echo chamber. Visions and beliefs are amplified through an endless amount of conferences and meetups that are both presented and visited by the same group of people.

Even though various organizations initiate blockchain teams within their structure, there is usually a yawning gap between these techies and top managers. Teams often find themselves inside the blockchain echo chamber, floating away from their peers to form lonely islands with little to no infiltration within the organization.

Looking at its current status, it’s very easy to dismiss blockchain as a fad. To counter the skepticism, we must all get out of our echo chamber and start delivering real and indisputable value. Not in a three-year plan, but today.

3. Catching flies with vinegar

When you make your peace with authority, you become the authority.”
- Jim Morrison

Bitcoin was created from an anarcho-capitalist philosophy. Fed up with governmental bodies and financial institutes ruling self-serving from their ivory towers, the makers sought to replace the extant system with a new, better one based on principles of self-ownership, self-reliance and self-regulation.

At the inception of bitcoin in 2008, we were very near an economic crisis, with a very negative sentiment towards the financial industry. These days, however the mood has shifted. Both general public and governing institutions are more than content with the current economic situation and primarily concerned with protecting the current prosperity.

The political agenda we've inherited from bitcoin is proving to be detrimental to adoption. Organizations that can drive the technology forward and are willing to embrace blockchain, are constantly being told they'll be obsolete soon. Can we, as a community, start supporting these organizations instead? Remember, you catch more flies with honey than with vinegar.

4. A bumpy ride

The road to adoption of a new technology is always a bumpy ride.

In 1956 the Dartmouth Conference gave birth to the field of Artificial Intelligence (AI) and started the first AI revolution. This revolution didn't last as the field failed to meet the expectations. After another rise and fall in 1980, it wasn't until the mid-1990's, when the Internet caused a technology boom, that AI managed to reach some world adoption.

We seem to be setting ourselves up for a similar ride for the blockchain. Are we truly willing to wait for another 30 to 40 years to reach a level of maturity?

Two decades ago, the field of AI stopped promising and started delivering. In 2018, it silently works in the background, powering many of the tools we all use on a daily basis. We must adopt a similar strategy for the blockchain if we want to prevent the pending collapse of our field.

5. The road to mass adoption

Where do we start with blockchain? Its short-term value predominantly lays in reducing costs and increasing efficiency for incumbent organizations. Change both within an organization and within society often provokes resistance.

To counter this, we should initially focus on low impact solutions and progressively introduce more significant implementations.

I. Added security for existing applications through anchoring

When explaining the blockchain to organizational decision makers, the word "immutable" particularly strikes their imagination and interest. All decisions within organizations, from blue-collar workers, to the upper management are done based on data. Unauthorized data manipulation can result in serious damages.

Of course, this immutability comes from distributing the data to a large number of independent parties. Data on a private blockchain run by a single organization is not nearly as immutable.

Second best is to **anchor** the data; writing a hash to a public blockchain. Data can still be manipulated, but this manipulation can easily be detected. This newly added layer of security doesn't yet depend on system privilege levels.

Anchoring is a non-intrusive method that can be applied to existing applications with little effort. An increasing amount of software companies and integrators start recognizing and implementing this method of data validation. Due to its low-transformational characteristics, we expect anchoring to become a common practice soon.

II. Public key authentication

Passwords, the most common form of authentication, don't meet the requirements organizations have today. A shift towards strong authentication using public keys has already begun. This shift started with mobile apps and with the adoption of the Web Authentication W3C standard, the web should shortly follow.

The blockchain can leverage this by providing decentralized authorization via a **dynamic chain of trust**, describing the trust relationship between identities. It enables validation of company policies and authorization both by the organization internally as well as externally. The chain of trust simplifies business processes and mitigates some of the most costly cyber scams.

III. Verifiable certificates

Paper certificates have proven to be unreliable. For as little as €50, you can purchase a novelty degree online. And the other hand organizational licenses and certificates are shrouded in bureaucracy, making them unnecessarily hard to administer and validate.

Similar to the chain of trust, the blockchain makes it trivial to issue publicly verifiable certificates, which can be easily revoked if needed.

For institutions that already make their certificates public, this is a non-intrusive and low-risk use case. It allows for increasing a progressive image by deploying the blockchain. These verifiable certificates could potentially root in society real quick, as the technology to realize these certificates is already available for real-world application.

IV. Decentralized workflows

The digital revolution has had a tremendous effect on the optimization of internal business processes. When it comes to inter-organizational processes, we have to acknowledge that the changes are less drastic. At best paper forms and faxes are replaced by digital forms and e-mail, but underlying processes have hardly changed.

Corporations are reluctant to rely on external systems operated by a counterparty.

With no single party in control of systems and data, decentralized workflows might be the answer.

Most corporations are still struggling with the concept of decentralized systems. Fortunately, influential parties in the shipping industry and, somewhat surprisingly, the EU government, are pushing forward the use of this technology.

Given that the pilot programs running today show costs savings and higher efficiency, we're bound to see large-scale blockchain powered decentralized solutions in production in 2019.

V. Self-sovereign identities

While there is a fair amount of enthusiasm for self-sovereign identities (SSI), large-scale adoption seems far off. Rather than SSI systems, new high-profile federated authentication systems are being released on a regular basis.

However, while consortiums are trying to push their federated systems, integrators are not content and adoption is relatively low. Current identity services only seem to work on a national level. Some countries may have multiple services, where other countries have none.

In contrast, SSI systems are not limited by national borders, allowing anyone to participate. The rise in popularity of public key authentication may give SSI the edge it needs.

VI. Tokenization

Tokenization has captured the imagination of the blockchain community, from tokenizing real estate and loyalty points to carbon emission rights.

One of the most anticipated applications of blockchain by businesses is the use of non-fungible tokens in a supply chain to battle counterfeit goods. While organizations are keen to solve this 2 trillion dollar issue, it will likely take years to see large-scale real-world implementations.

Supply chain solutions face some major challenges; All parties in the supply chain need to participate, from the manufacturer to the end customers. Multiple, often legacy, software systems need to update. Another issue is bulk packaging. Items need to be uniquely identifiable or already in their final packaging.

Unfortunately, most tokenization initiatives only focus on fulfilling an ideology but fail to provide actual business value over existing non-blockchain solutions. We expect tokenization to be the subject of pilots for the coming years, followed by a major shake out before we get to see these solutions have any impact on industries.

VII. Trustless financial products

While bitcoin came to life as a reaction to failing banks in a dysfunctioning financial system, fiat currencies survived the Great Recession mostly unscathed. As a result, FinTech solutions that don't support the local currency are not usable by governments and businesses in a meaningful way.

For example, most employees won't accept getting their salary in cryptocurrency. The currencies are much too volatile. A deposit in Ethereum has an enormous risk of decreasing in value while locked.

This is not the only hurdle. Immutable and public nature of smart contracts are arguably the biggest assets, but they're also the source of many new challenges concerning scalability, privacy, security and legal context.

Given the huge potential impact on the financial system, activity of FinTech related blockchain projects will probably not diminish any time soon. This will continue to be experimental though. At best, we might see a blockchain based interbank infrastructure in the near future.

Other use cases for the blockchain are simply far less challenging both in technical and social context. General availability of trustless financial products should not be

6. Conclusion

Trusting upon blockchain to handle day-to-day business processes is a necessary first step towards mass adoption and the creation of strategic business value. Organizations must be allowed to experience the benefits of the blockchain as supportive technology.

Recently failed proof of half-baked concepts aimed to transform industries has mostly led to disillusion for organizations and their decision makers. If we want to make blockchain a success - regardless of who we are - we should manage expectations and create a long-term realistic plan. Additionally, we must stop scaring decision makers with stories of blockchain immediately disrupting their organization and jeopardizing thousands of jobs.

By pursuing baby steps in a long road to mass adoption, we can change the way organizations view the current state of blockchain, making them understand and embrace the numerous advantages the technology has to offer.

The blockchain is a sound concept and there is no doubt it will have its role eventually. However, we - the blockchain community - decide today, if we'll look back at this period as the peak of just another hype cycle, or as our 1995.



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